

CLAIMS

What is claimed is:

- 5 1. A solder paste distribution tool, comprising:
a support member for attaching to a tool holder;
a distribution member that defines a solder paste aperture having a
non-circular cross-sectional shape; and
a fastener that secures the distribution member to the support member.
- 10 2. The solder paste distribution tool of claim 1 wherein the non-circular
cross-sectional shape of the solder paste aperture includes partially coinciding
circles having different diameters.
- 15 3. The solder paste distribution tool of claim 2 wherein the partially coinciding
circles include:
a first circle having a first diameter; and
a second circle having a second diameter that is less than the first
diameter, the second circle being disposed relative to the first circle such that
when the first circle aligns over a soldering pad of a circuit board, at least a
portion of the second circle aligns over at least a portion of a stringer leading to
the soldering pad.
- 20 4. The solder paste distribution tool of claim 1 wherein the distribution member
defines multiple solder paste apertures which include the solder paste aperture
having the non-circular cross-sectional shape.

5. The solder paste distribution tool of claim 4 wherein the cross-sectional shape of each of the multiple solder paste apertures includes a first circle having a first diameter and a second circle having a second diameter that is different than the first diameter, the second circle partially coinciding with the first circle; and
5 wherein, for each of the multiple solder paste apertures, the second circle of that non-circular solder paste aperture resides in a same direction relative to the first circle of that solder paste aperture.
- 10 6. The solder paste distribution tool of claim 4 wherein the cross-sectional shape of each of the multiple solder paste apertures includes a first circle having a first diameter and a second circle having a second diameter that is different than the first diameter, the second circle partially coinciding with the first circle; wherein, for a first solder paste aperture, the second circle of the first solder paste aperture resides in a first direction relative to the first circle of the first solder paste aperture; and wherein, for a second solder paste aperture, the second circle of the second solder paste aperture resides in a second direction relative to the first circle of the second solder paste aperture, the second direction being different than the first direction.
15
20 7. A solder paste distribution system, comprising:
a base;
a tool holder coupled to the base; and
a solder paste distribution tool, coupled to the tool holder, the solder paste distribution tool including:
25 a support member that couples to the tool holder,
a distribution member that defines a solder paste aperture having a non-circular cross-sectional shape, and
a fastener that secures the distribution member to the support member.

8. The solder paste distribution system of claim 7 wherein the non-circular cross-sectional shape of the solder paste aperture includes partially coinciding circles having different diameters.
- 5 9. The solder paste distribution system of claim 8 wherein the partially coinciding circles include:
- a first circle having a first diameter; and
- a second circle having a second diameter that is less than the first diameter, the second circle being disposed relative to the first circle such that when the first circle aligns over a soldering pad of a circuit board, at least a portion of the second circle aligns over at least a portion of a stringer leading to the soldering pad.
- 10 10. The solder paste distribution system of claim 7 wherein the distribution member of the solder paste distribution tool defines multiple solder paste apertures which include the solder paste aperture having the non-circular cross-sectional shape.
- 15 11. The solder paste distribution system of claim 10 wherein the cross-sectional shape of each of the multiple solder paste apertures includes a first circle having a first diameter and a second circle having a second diameter that is different than the first diameter, the second circle partially coinciding with the first circle; and wherein, for each of the multiple solder paste apertures, the second circle of that solder paste aperture resides in a same direction relative to the first circle of that solder paste aperture.
- 20

12. The solder paste distribution system of claim 10 wherein cross-sectional shape of each of the multiple solder paste apertures includes a first circle having a first diameter and a second circle having a second diameter that is different than the first diameter, the second circle partially coinciding with the first circle; wherein, for a first solder paste aperture, the second circle of the first solder paste aperture resides in a first direction relative to the first circle of the first solder paste aperture; and wherein, for a second solder paste aperture, the second circle of the second solder paste aperture resides in a second direction relative to the first circle of the second solder paste aperture, the second direction being different than the first direction.

13. A method for mounting a circuit board component to a circuit board, comprising the steps of:

positioning a solder paste distribution tool over a mounting location of the circuit board, the solder paste distribution tool defining a solder paste aperture having a non-circular cross-sectional shape;

applying solder paste to the mounting location of the circuit board through the solder paste distribution tool such that a portion of the solder paste passes onto the mounting location through the solder paste aperture having the non-circular cross-sectional shape;

removing the solder paste distribution tool from the mounting location;
and

disposing the circuit board component over the mounting location and providing heat to form solder joints between the circuit board component and the circuit board, one of the solder joints being formed from the portion of the solder paste that passed onto the mounting location through the solder paste aperture having the non-circular cross-sectional shape.

14. The method of claim 13 wherein the non-circular cross-sectional shape of the solder paste aperture includes partially coinciding circles having different diameters, and wherein the step of applying the solder paste includes the step of: passing the portion of the solder paste through the partially coinciding

5 circles having different diameters.

15. The method of claim 14 wherein the partially coinciding circles include a first circle having a first diameter, and a second circle having a second diameter that is less than the first diameter; and wherein the step of positioning the solder paste distribution tool includes the step of:

orienting the solder past distribution tool relative to the circuit board such that the first circle aligns over a soldering pad of the mounting location of the circuit board, and at least a portion of the second circle aligns over at least a portion of a stringer leading to the soldering pad.

The method of claim 13 wherein the solder paste distribution tool defines multiple solder paste apertures which include the solder paste aperture having the non-circular cross-sectional shape, and wherein the step of applying the solder paste includes the step of:

passing the solder paste through the multiple solder paste apertures onto the mounting location of the circuit board.

17. The method of claim 16 wherein the non-circular cross-sectional shape of each of
the multiple solder paste apertures includes a first circle having a first diameter
and a second circle having a second diameter that is different than the first
diameter, the second circle partially coinciding with the first circle; wherein, for
each of the multiple solder paste apertures, the second circle of that non-circular
solder paste aperture resides in a same direction relative to the first circle of that
solder paste aperture; and wherein the step of passing the solder paste includes the
step of:

providing portions of the solder paste through the first and second circles
of the solder paste apertures.

- 10
15
20
18. The method of claim 16 wherein the non-circular cross-sectional shape of each of
the multiple solder paste apertures includes a first circle having a first diameter
and a second circle having a second diameter that is different than the first
diameter, the second circle partially coinciding with the first circle; wherein, for a
first solder paste aperture, the second circle of the first solder paste aperture
resides in a first direction relative to the first circle of the first solder paste
aperture; wherein, for a second solder paste aperture, the second circle of the
second solder paste aperture resides in a second direction relative to the first circle
of the second solder paste aperture, the second direction being different than the
first direction; and wherein the step of passing the solder paste includes the step
of:

providing portions of the solder paste through the first and second circles
of the solder paste apertures.

19. A method for making a solder paste distribution tool, comprising the steps of:

providing a support member;

providing a distribution member that includes a solder paste aperture having a non-circular cross-sectional shape; and

fastening the distribution member to the support member.

5

20. The method of claim 19, wherein the step of providing the distribution member includes the step of:

drilling partially coinciding circles through a solid substrate in order to form the distribution member that includes the solder paste aperture having the non-circular cross-sectional shape.

10

RECEIVED
U.S. PATENT AND TRADEMARK OFFICE